

- (1). (a). An employee who works on a production line has notified her employer that she is pregnant. **Outline** the factors that the employer should consider when undertaking a specific risk assessment in relation to this employee.

Seorang pekerja yang bekerja di bahagian pengeluaran telah memberitahu majikannya yang dia mengandung. Gariskan faktor yang majikan perlu pertimbangkan apabila melakukan penilaian risiko tertentu berkaitan dengan pekerja ini.

(6 marks/markah)

- (b). On 27 October 2022, at 3.40 pm, a fire and explosion were reported at the Petroliam Nasional Bhd. (Petronas) oil refinery located in the Pengerang Integrated Complex (PIC) in Johor. According to Petronas Refinery and Petrochemical Corporation Sdn. Bhd. (PRPC), the fire and explosion occurred at one of the interconnecting pipes located in the PIC. The PRPC's Emergency Response Team was called in to contain the incident. The fire was completely extinguished at 4.50 pm. No injured or death was reported. The incident poses no immediate threat to the surrounding communities.

Pada 27 Oktober 2022, jam 3.40 petang, satu kebakaran dan letupan dilaporkan berlaku di kilang penapis minyak Petroliam Nasional Bhd. (Petronas) yang terletak di Kompleks Bersepadu Pengerang (PIC) di Johor. Menurut Petronas Refinery and Petrochemical Corporation Sdn. Bhd. (PRPC), kebakaran dan letupan itu berlaku di salah satu paip penghubung yang terletak di PIC. Pasukan Tindak Balas Kecemasan PRPC telah dipanggil untuk membantu membendung kejadian itu, dan semua pihak berkuasa yang berkaitan telah dimaklumkan. Kebakaran berjaya

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dipadamkan sepenuhnya pada pukul 4.50 petang. Tiada kecederaan atau kematian dilaporkan. Kejadian itu tidak memberi ancaman kepada masyarakat sekitar.

As a safety officer,

Sebagai seorang pegawai keselamatan

- (i). Describes the action taken after the accident

Jelaskan tindakan yang diambil selepas kemalangan.

(6 marks/markah)

- (ii). Explain the possible causes of the accident.

Terangkan kemungkinan punca kemalangan.

(7 marks/markah)

- (iii). Discusses the steps involved in the investigation process of the accident.

Bincangkan langkah-langkah proses penyiasatan bagi kemalangan tersebut.

(6 marks/markah)

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- (2). There are many ways to prevent accidents. One way is to control hazards identified in the workplace. When determining control measures in the workplace, a hierarchy of risk controls is commonly used.

Terdapat banyak cara boleh mengelakkan kemalangan. Salah satu cara adalah dengan mengawal bahaya yang dikenalpasti di tempat kerja. Apabila menentukan langkah kawalan di tempat kerja, hierarki kawalan risiko biasanya digunakan.

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- (a). With the aid of a diagram, interpret the hierarchy of risk controls.
Dengan bantuan gambar rajah, huraikan hierarki kawalan risiko.
(10 marks/markah)
- (b). Figure 1 (a) shows an electric motor with a belt drive that provides a large amount of low frequency noise because of the vibration of the broad belt. Risk Assessment Team has proposed a few suggestions to reduce the noise problem.
- Suggestion A: To wear ear muff when operating the electric motor.
 - Suggestion B: To replace broad belt with narrower belts, separated by spacers (Figure 1 (b)).
 - Suggestion C: To limit the operating hour of the electric motor.

Based on the hierarchy of risk controls, explain the suggestions above and determine the best solution to solve the noise problem of the electric motor. In your opinion, what are the other concerns for implementation of risk controls.

Rajah 1 (a) menunjukkan sebuah motor elektrik dengan pemacu tali pinggang yang memberikan sejumlah besar hingar frekuensi rendah disebabkan getaran daripada tali pinggang yang lebar. Pasukan Penilaian Risiko telah memberi beberapa cadangan untuk mengurangkan masalah bunyi.

- *Cadangan A: Memakai penutup telinga semasa mengendalikan motor elektrik.*
- *Cadangan B: Menggantikan tali pinggang yang lebar dengan tali pinggang yang lebih sempit, dan dipisahkan oleh pengatur jarak (Rajah 1 (b)).*
- *Cadangan C: Menghadkan waktu operasi motor elektrik.*

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Berdasarkan hierarki kawalan risiko, terangkan cadangan di atas dan tentukan penyelesaian terbaik untuk menyelesaikan masalah bunyi motor elektrik. Pada pendapat anda, apakah kebimbangan lain untuk pelaksanaan kawalan risiko.

(15 marks/markah)

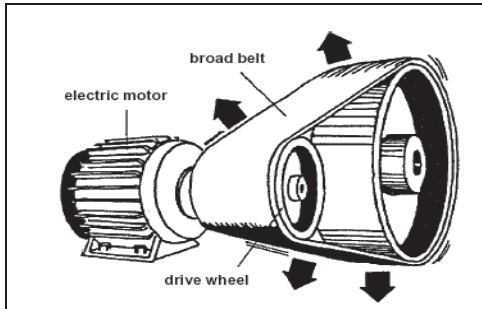


Figure 1 (a)

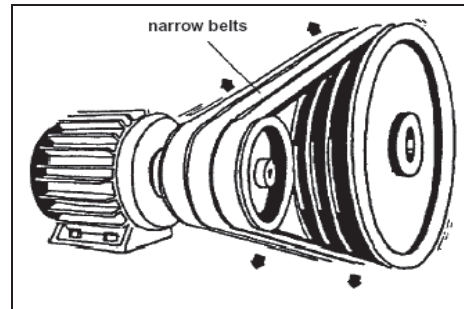


Figure 1 (b)

- (3). A new maintenance staff, X was killed in an accident in a train tunnel (confined space). Out of the five people in the maintenance team, X was the new member who was still under probation sent to inspect a device in the tunnel when the accident happened.

The team led by a supervisor; Y was moving on the walkway beside the track on the way to the location of the device in the tunnel. A train went through the tunnel at the same time, four people including the supervisor managed to avoid the train, while the victim was not able to react in time.

After the incident, the train driver, Z said that he had not received any information that there will be a maintenance going on in the tunnel. The train was moving at a relative high speed, and there was nothing he could do to stop the train. The company director in charge of facilities and maintenance, W arrived at the scene half an hour later to understand the situation.

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Seorang pekerja penyelenggaraan baru, X terbunuh dalam kemalangan di terowong kereta api (ruang terkurung). Daripada lima orang dalam pasukan penyelenggaraan, X merupakan ahli baharu yang masih dalam tempoh percubaan telah dihantar untuk memeriksa peranti di dalam terowong ketika kemalangan itu berlaku.

Pasukan yang diketuai oleh seorang penyelia; Y sedang bergerak di laluan pejalan kaki di sebelah trek dalam perjalanan ke lokasi peranti di dalam terowong. Sebuah kereta api melalui terowong pada masa sama, empat orang termasuk penyelia berjaya mengelak kereta api itu, manakala mangsa tidak dapat bertindak balas mengikut masa.

Selepas kejadian itu, pemandu kereta api, Z berkata, dia tidak menerima sebarang maklumat bahawa akan ada kerja-kerja penyelenggaraan di dalam terowong itu. Kereta api itu bergerak pada kelajuan yang agak tinggi, dan tiada apa yang boleh dia lakukan untuk menghentikan kereta api itu. Pengarah syarikat yang bertanggungjawab ke atas kemudahan dan penyelenggaraan, W tiba di tempat kejadian setengah jam kemudian untuk memahami keadaan.

- (a). Based on your understanding about regulations for workplace safety, who do you think are the stakeholders should be involved in the investigation and who could be held liable for the accident. Cite the relevant regulations and provide reasons for your answer. (You may refer to the Appendix for List of Legislations and Guidelines Related to Environmental, Health and Safety)

Berdasarkan pemahaman anda tentang peraturan untuk keselamatan tempat kerja, pada pendapat anda, siapakah pihak berkepentingan yang harus terlibat dalam penyiasatan dan siapa yang boleh dipertanggungjawabkan atas kemalangan itu. Petik

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peraturan yang berkaitan dan berikan sebab untuk jawapan anda. (Anda boleh merujuk Lampiran untuk Senarai Perundangan dan Garis Panduan Berkaitan Alam Sekitar, Kesihatan dan Keselamatan)

(15 marks/markah)

- (b). Explain the safety measures that should be in place to ensure that the accident will not be repeated.

Terangkan langkah-langkah keselamatan yang perlu disediakan untuk memastikan kemalangan itu tidak berulang.

(10 marks/markah)

- (4). (a). Discuss SIX (6) ways in which an employer can promote and implement a positive safety and health culture in the workplace.

Bincangkan ENAM (6) cara yang mana majikan dapat mempromosi dan melaksanakan budaya keselamatan dan kesihatan yang positif di tempat kerja.

(8 marks/markah)

- (b). Many problems in safety and health at the workplace arise due to poor communication. Explain THREE (3) basic methods of effective communication in relation to health and safety in the workplace.

Banyak masalah keselamatan dan kesihatan di tempat kerja timbul akibat komunikasi yang lemah. Terangkan TIGA (3) kaedah asas komunikasi berkesan berhubung dengan kesihatan dan keselamatan di tempat kerja.

(8 marks/markah)

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- (c). ISO 45001:2018 is an international standard that specifies requirements for an occupational safety and health management system and also as a standard to enable organizations to proactively improve their occupational safety and health performance in preventing injury and ill health. Explain FOUR roles and responsibilities of top management in any industry to implement the ISO 45001:2018.

ISO 45001:2018 ialah piawaian antarabangsa yang menetapkan keperluan untuk sistem pengurusan keselamatan dan kesihatan pekerjaan dan juga sebagai piawaian untuk membolehkan organisasi meningkatkan prestasi keselamatan dan kesihatan pekerjaannya secara proaktif dalam mencegah kecederaan dan keuzuran. Terangkan EMPAT peranan dan tanggungjawab pengurusan atasan dalam mana-mana industri untuk melaksanakan ISO 45001:2018.

(9 marks/markah)#

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Appendix: List of Legislations and Guidelines Related to Environmental, Health and Safety**Regulations under Occupational Safety and Health Act 1994**

00. Occupational Safety and Health (Noise Exposure) Regulations 2019
01. Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013
02. Occupational Safety and Health (Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease) Regulations 2004
03. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000
05. Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous' Chemicals) Regulations 1997 (Revoked)
06. Occupational Safety and Health (Safety and Health Committee) Regulations 1996
07. Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulations 1996
08. Occupational Safety and Health (Employers' Safety and Health General Policy Statements) (Exception) Regulations 1995

Orders under OSHA 1994

01. Occupational Safety and Health (Prohibition of Use of Substances) Order 1999
02. Occupational Safety and Health (Safety and Health Officer) Order 1997

Codes of Practices under OSHA 1994Chemical Management

01. Industry Code of Practice on Chemicals Classification and Hazard Communication, 2014
02. Industry Code of Practice on Indoor Air Quality, 2010

Industrial Hygiene

Industry Code of Practice for Safe Working in a Confined Space, 2010

Occupational Health

01. Code of Practice on Prevention and Eradication of Drug, Alcohol and Substance Abuse in the Workplace, 2005
02. Code of Practice on Prevention and Management of HIV/AIDS at the Workplace, 2001

Transportation

01. Code of Practice for Road Transport Activities, 2010
02. Code of Practice on Safety, Health and Environment for Transportation Sector (SHE Code), 2007

Guidelines under OSHA 1994Agriculture, Forestry & Fishing

01. Guidelines on Occupational Safety and Health in Logging Operations, 2004
02. Guidelines on Occupational Safety and Health in Fishing and Aquaculture Operations, 2003
03. Guidelines on Occupational Safety and Health in Agriculture, 2002
04. Guidelines on Occupational Safety and Health in Agriculture, 2002 (Mandarin Version)
05. Guidelines on Occupational Safety and Health in Agriculture, 2002 (Tamil Version)

Building Construction & Engineering Work

01. Guidelines on Occupational Safety and Health in Construction Industry (Excavation Work) 2017
02. Guidelines of Occupational Safety and Health in Construction Industry 2017
03. Guidelines for Approval of Design Scaffolding 2016
04. Calculation Loading of Scaffolding 2016
05. Guidelines for Public Safety and Health at Construction Sites, 2007
06. Guidelines for the Prevention of Falls at Workplaces, 2007
07. Guidelines on Trenching for Construction Safety, 2000
08. Guidelines on Occupational Safety and Health in Tunnel Construction, 1998

Chemical

01. Guidelines on Control and Safe Handling of Nanomaterials
02. (1) A Manual of Recommended Practice on Assessment of the Health Risks Arising from the Use of Chemicals Hazardous to Health at the Workplace (3rd Edition) (First Reprint 2018)
02. (2) Corrigenda - A Manual of Recommended Practice on Assessment of the Health Risks Arising from the Use of Chemicals Hazardous to Health at the Workplace (3rd Edition)
03. Guidelines for Asbestos Removal 2017
04. Guidelines on Mercury Management in Oil and Gas Industry, 2011
05. Panduan bagi Menggunakan Penaksiran Risiko Bahan Kimia Berbahaya kepada Kesihatan (CHRA) Secara Generik, 2006
06. Guidelines on Storage of Hazardous Chemicals: A Guide for Safe Warehousing of Packaged Hazardous Chemicals, 2005
07. Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, 2005
08. Guidelines on the Monitoring of Airborne Contaminant for Chemicals Hazardous to Health, 2002
09. Guidelines on the Control of Chemicals Hazardous to Health, 2001

Competency

00. Guidelines for Registration of Competent Firm (Petroleum Contractor)
01. Garis Panduan Pengikitrafan Sebagai Pusat Pengajar Pengendali Perancah, 2016
02. Garis Panduan Sistem Mata bagi Program Pendidikan Berterusan, 2011
03. Garis Panduan Pendaftaran Pusat Pengajar Penyelia Keselamatan Tapak Bina, 2011

04. Garis Panduan Latihan Pekerja, Pendaftaran Pusat Pengajar dan Pengendalian Kursus Keselamatan dan Kesihatan Pekerjaan di Ruang Terkurung, 2008
05. Garis Panduan Pengiktirafan Sebagai Pusat Pengajar Kursus Operator Kren, 2004
06. Garis Panduan untuk Memohon Sebagai Pusat Pengajar Pegawai Keselamatan dan Kesihatan, 2003
07. Guidelines for the Registration of Assessors, Hygiene Technician and Occupational Health Doctor, 2000
08. Examination Syllabus for Engineer's Certification of Competency (Steam and Internal Combustion Engines) Examination, 1996
09. Guidelines for Registration - Responsible Person for Tower Crane Installer-Maintainer / Passenger & Goods Hoisting Machine and Gondola

Ergonomic

01. Guidelines for Manual Handling at Workplace 2018
02. Guidelines on Ergonomics Risk Assessment at Workplace 2017
03. Guidelines on Occupational Safety and Health for Seating at Work, 2003
04. Guidelines on Occupational Safety and Health for Standing at Work, 2002
05. Guidelines on Occupational Safety and Health for Working with Video Display Unit (VDU's), 2003
06. Guidelines on Occupational Vibration, 2003

General

01. Guidelines on Grass Cutter Safety Handling 2018
02. Guidelines on Occupational Safety and Health in Construction, Operation and Maintenance of Biogas Plant, 2016
03. Guidelines on Contract Management 2015
04. Guidelines in Courier Services Industry 2015
05. Guidelines for The Factories and Machinery (Special Scheme Inspection) (Risk-Based Inspection), 2014
06. Guidelines for Media Professionals, 2012
07. Guidelines on Occupational Safety and Health Management Systems (OSHMS), 2011
08. Guidelines on Occupational Safety and Health Act 1994 (Act 514), 2006
09. Guidelines on Occupational Safety and Health (Notification of Accident, Dangerous Occurrence, Occupational Poisoning & Occupational Disease) Regulations 2004 (NADOPOD), 2005
10. Guidelines on Occupational Safety and Health in the Service Sector, 2004

HIRARC

01. Guidelines for Hazard Identification, Risk Assessment and Risk Control (HIRARC), 2008

Industrial Hygiene

01. Guidelines on OSH for Lighting at Workplace
02. Guidelines on Heat Stress Management at Workplace 2016
03. Guidelines on Occupational Safety and Health for Design, Inspection, Testing and Examination of Local Exhaust Ventilation System, 2008
04. Guidelines for Control of Occupational Noise, 2005

Industrial Safety

01. Guidelines on Safe Use of Press Machines, 2015
02. Guidelines on the safe use of lifts and escalators, 2010
03. Guidelines on the Safety Management of Amusement Park Devices, 2008
04. Guidelines for Preparation of Demonstration of Safe Operation Document (General), 2001
05. Guidelines for Preparation of Demonstration of Safe Operation Document (Storage of Liquefied Petroleum Gas in Cylinder), 2001

Occupational Health

01. Guidelines on Aedes Mosquito Control in Construction Sites, 2015
02. Guidelines for the Protection of Employees Against the Effects of Haze at Workplaces, 2013
03. Guidelines on Occupational Health Services, 2005
04. Guidelines on Preventing and Responding to Drugs and Alcohol Problems in the Workplace, 2004
05. Guidelines on First Aid in the Workplace (2nd Edition), 2004
06. Guidelines on Reproductive Health Policy & Programmes at the Workplace, 2002
07. Guidelines on Medical Surveillance, 2001
08. Guidance for the Prevention of Stress and Violence at the Workplace, 2001

Regulations under Factories and Machinery Act 1967

00. Factories and Machinery (Noise Exposure) (Revocation) Regulations 2019
01. Factories dan Machinery (Steam Boiler and Unfired Pressure Vessel) (Amendment) Regulations 2017
02. Factories dan Machinery (Steam Boiler and Unfired Pressure Vessel) Regulations 1970: Fourth Schedule - Inspecting Authorities (Amendment) 2014
03. Factories and Machinery (Person-In-Charge) (Amendment) Regulations 2014
04. Factories and Machinery (Special Scheme of Inspection) (Risk-Based Inspection) Regulations 2014
05. Factories and Machinery (Noise Exposure) Regulations 1989
06. Factories and Machinery (Mineral Dust) Regulations 1989
07. Factories and Machinery (Asbestos) Regulations 1986
08. Factories and Machinery (Building Operations and Works of Engineering Construction) (Safety) Regulations 1986
09. Factories and Machinery (Leads) Regulations 1984
10. Factories and Machinery (Compounding of Offences) Rules 1978
11. Factories and Machinery (Compoundable Offences) Regulations 1978
12. Factories and Machinery (Certificates of Competency Examinations) Regulations 1970
13. Factories and Machinery (Administration) Regulations 1970
14. Factories and Machinery (Notification of Fitness and Inspections) Regulations 1970
15. Factories and Machinery (Electric Passenger and Goods Lift) Regulations 1970
16. Factories and Machinery (Fencing of Machinery and Safety) Regulations 1970
17. Factories and Machinery (Safety, Health and Welfare) Regulations 1970
18. Factories and Machinery (Steam Boiler and Unfired Pressure Vessel) Regulations 1970
19. Factories and Machinery (Person in Charge) Regulations 1970

Orders under FMA 1967

01. Factories and Machinery (Exemption of Certificate of Fitness for Unfired Pressure Vessel) Order 2017
02. Factories and Machinery (Exemption of Certificate of Fitness for Hoisting Machine) Order 2015
03. Factories and Machinery (Exemption to Petroleum Nasional Berhad) Order 2013

Fire Services Act 1988

Relevant Legislations and Guidelines Related to Building Fire Safety and Heritage Building in Malaysia (other than OSHA 1994 and FSA 1988):

01. Street Drainage and Building Act 1974 (Act 133)
02. Uniform Building by Law 1984
03. Fire Services (Designated Premises) Order 1998
04. Fire Services (Fire Certificate) Regulations 2001
05. National Heritage Act 2005 (Act 645)

Malaysian Standards for Fire Protection

01. MS 1489:1999 Fire Extinguishing Installations and Equipment
02. MS 1539:2018 Specifications for Portable Fire Extinguishers
03. MS 1745:2004 Fire Detection and Fire Alarm Systems
04. MS 1910:2006 Fixed Firefighting Systems - Automatic Sprinkler Systems
05. MS 1590:2003 Carbon Dioxide Extinguishing Systems
06. MS 1183:2015 Fire Safety in the Design, Management and Use of Building – Code of Practice

Regulations under Atomic Energy Licensing Act 1984 (Act 304)

01. Radiation Protection (Licensing) Regulations 1986
02. Radiation Protection (Basic Safety Standards) Regulations 2010
03. Radiation Protection (Transport) Regulations 1989

Regulations under Electricity Supply Act 1990

01. Electricity Regulations 1994
02. Electricity Supply (Compounding of Offences) Regulations 2001
03. Licensee Supply Regulations 1990
04. Gas Supply Regulations 1997

Rules under Environmental Quality Act 1974

Environmental Quality (Compounding of Offences) (Open Burning) Rules 2000
Environmental Quality (Compounding of Offences) (Amendment) Rules 1999

Regulations under EQA 1974

Environmental Quality (Control of Emission from Diesel Engines) Regulations 1996 (Amendment 2000)
Environmental Quality (Clean Air) Regulations 1978 (Amendment 2000)
Environmental Quality (Scheduled Wastes) Regulations 2005 (Amendment 2007)
Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977 (Amendment 1982)
Environmental Quality (Prescribed Premises Scheduled Wastes Treatment and Disposal Facilities) Regulations 1989 (Amendment 2006)
Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations 1978
Environmental Quality (Refrigerant Management) Regulations 1999
Environmental Quality (Halon Management) Regulations 1999
Environmental Quality (Scheduled Wastes) Regulations 2005
Environmental Quality (Motor Vehicle Noise) Regulations 1987
Environmental Quality (Industrial Effluent) Regulations 2009
Environmental Quality (Control of Petrol and Diesel Properties) Regulations 2007
Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations 1985
Environmental Quality (Control of Emission from Diesel Engines) Regulations 1996
Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996
Environmental Quality (Control of Emission from Motorcycles) Regulations 2003
Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009
Environmental Quality (Sewage) Regulations 2009
Environmental Quality (Appeal Board) Regulations 2003
Environmental Quality (Licensing) Regulations 1977

Orders under EQA 1974

Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015
Environmental Quality (Prescribed Activities) (Open Burning) Order 2003
Environmental Quality (Prohibition on The Use of Chlorofluorocarbons and Other Gases as Propellants and Blowing Agents) Order 1993
Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities Order) (Amendment) 2006
Environmental Quality (Prescribed Conveyance) (Scheduled Wastes) Order 2005
Environmental Quality (Delegation of Powers on Marine Pollution Control) Order 1994
Environmental Quality (Delegation of Powers Halon Management) Order 2000
Environmental Quality (Delegation of Powers) (Investigation of Open Burning) Order 2000
Environmental Quality (Delegation of Powers) Order 2005
Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Order 1978
Environmental Quality (Prescribed Premises) (Crude Palm Oil) Order 1977

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